[P3.148]

Integrated morphologic, metabolic, molecular and spectral methods for the identification of *Aspergillus* Section *Flavi* isolated from Portuguese almonds

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Aspergillus is a large genus, with a complex and ever evolving taxonomy. Section *Flavi* is one of the most significant Sections in the Genus. Taxonomy and species identification is subject of great interest for scientists aiming to clarify the species concept and limits within the section. Furthermore, this Section comprises both toxigenic and non-toxigenic species/strains, with great interest to food industry.

Taxonomy of Section *Flavi* currently depends on multivariate approaches entailing both phenotypic (morphology, extrolite profiles) and molecular traits. No method works flawlessly in recognising species, so polyphasic approaches should be given emphasis in taxonomic decision-making.

This work aims to identify strains from Section *Flavi* by combining various methods, including morphological, biochemical and molecular ones, as well as the novel approach based on spectral analysis by MALDI-TOF-ICMS.

About 350 fungal isolates from Portuguese almonds, all belonging to Section *Flavi*, were characterised morphologically and biochemically. From those, 26 were selected for further analysis. Mycotoxigenic patterns, partial calmodulin gene sequences and MALDI-TOF protein spectra were analysed, dendrograms were created and results were compared.

We obtained good agreement between methods on species level identification. Additionally, the few incongruencies detected between morphological and biochemical data were well resolved with the molecular and spectral analyses.

Keywords: Aspergillus Section Flavi, taxonomy, polyphasic identification